

## **REMARKS**

Reconsideration of this application in light of the present remarks is respectfully requested. Claims 1-14 remain pending in this application.

### **Substantive matters**

Claims 1-14 have been rejected under 35 USC 101 and 35 USC 112(1). Examiner has asserted that the claimed invention is not supported by a credible or well established utility, and that one skilled in the art clearly would not know how to use the claimed invention. These rejections are respectfully traversed, based on the following remarks.

Applicant's claimed invention is directed to an arrangement that includes a component to be cooled (e.g., an integrated circuit), an electrical component (e.g., an inductive component, such as a transformer, that includes a core), and a heat transfer device (e.g., a resilient mat) that is situated between, and in contact with, the component to be cooled and the electrical component. During operation, the claimed arrangement functions to transfer heat from the component to be cooled to the electrical component (which acts as a heat sink) by way of the heat transfer device.

Examiner's stated grounds for the rejections under 35 USC 101 and 35 USC 112(1) essentially revolve around the fact that Examiner does not understand how the electrical component can function to remove heat from the component to be cooled, given that the electrical component is taught as being an active (and therefore, as correctly pointed out by the Examiner, a heat producing) part of the circuit arrangement. Applicant respectfully submits that Examiner's rejections are without merit, and should therefore be withdrawn.

With all due respect, Applicant believes that Examiner's confusion on this point stems from Examiner's failure to recall and/or appreciate a rudimentary principle of physics (i.e., thermal conduction) that is universally understood not only by those trained in the

electrical/electronic engineering arts, but also by those possessing ordinary skill in just about any of a host of engineering/scientific disciplines. More particularly, as is well known to those with a conventional engineering/science background, heat conduction occurs whenever two bodies (say, body A and body B) having different temperatures (say,  $T_A$  and  $T_B$ ) are placed in physical contact (either directly or, more commonly, by way of an intervening thermally conductive medium) with each other. The direction of heat flow will be from the higher temperature body (A) to the lower temperature body (B). For instance, under a condition where  $T_A$  (i.e., the temperature of body A prior to being placed in contact with body B) is greater than  $T_B$  (i.e., the temperature of body B prior to being placed in contact with body A), when physical contact is established between bodies A and B, heat will flow from body A (the higher temperature body) to body B (the lower temperature body), with a consequent decrease in  $T_A$  and an increase in  $T_B$ ; the amount of the decrease in  $T_A$  and the amount of the increase in  $T_B$  are dependent upon a number of factors, including the effective thermal masses of bodies A and B, the thermal conductivity of the intervening thermally conductive medium, the effective areas of contact between body A, body B, and the intervening thermally conductive medium, and the nature/quality of the contact between body A, body B, and the intervening thermally conductive medium.

Significantly, a situation in which body B is a heat source (i.e.,  $T_B$  is greater than the ambient temperature of the surrounding air) does not, by itself, mean that body B cannot serve as a heat sink for body A. If body A is warmer than body B (i.e., if  $T_A > T_B$ ) prior to contact being established between the two bodies, then heat will flow from body A to body B when contact is established between the two bodies, causing a reduction in  $T_A$  and an increase in  $T_B$ ; this will occur regardless of the absolute temperatures of the two bodies.

To those skilled in the arts most pertinent to the present invention (e.g., electronic circuits, power supplies, electronic ballasts, etc), the aforementioned principles are exceedingly

fundamental. Additionally, it is well understood by those skilled in the relevant arts that, while inductive components dissipate significant electrical energy and generate a certain amount of heat (which is largely attributable to dissipative effects, such as losses in the winding(s) and core losses), the operating temperatures of the inductive components are typically substantially lower than the operating temperatures of certain other components (e.g., semiconductor-based components, such as power transistors and integrated circuits). The relatively lower operating temperatures of the inductive components (especially in the cores) are attributable, at least in part, to the fact that the inductive components typically have a physical size (and, hence, a thermal mass) that is much larger than that of certain other components (e.g., power transistors, integrated circuits, etc.); correspondingly, in comparison with certain other components, the inductive components experience a lower rise in temperature for a given amount of power dissipated within the component. Consequently, even though an operating inductive component dissipates some electrical energy and correspondingly generates a finite (nonzero) amount of heat, its temperature is typically significantly lower than that of certain other high power components within the circuit arrangement. Additionally, because an operating inductive component is typically much larger than certain other components, the rise in temperature experienced by the inductive component upon being placed in contact with a component to be cooled will be modest in comparison with the resulting drop in temperature experienced by the component to be cooled.

Applicant's claimed invention utilizes these principles to provide an economical arrangement and method by which the operating temperatures of certain other components (e.g., one or more integrated circuits, power transistors, etc.) can be effectively reduced by placing those certain other components in contact (preferably, via a heat transfer device such as a resilient mat) with a component (preferably, an inductive component having a core) having a

lower operating temperature than that of the certain other components. Toward this end, Applicant's written description and drawings provide detailed teachings for implementing the claimed invention. Thus, it should be abundantly clear to those of ordinary skill in the art that Applicant's claimed invention will be quite operable and will function as disclosed under typical conditions wherein the electrical component (e.g., inductive component) has an operating temperature that is lower than the operating temperature of the component to be cooled (e.g., integrated circuit). Moreover, the teachings of Applicant's specification are more than adequate as to implementation details, etc. to enable one of ordinary skill in the art to successfully practice the claimed invention without undue experimentation.

In view of the above clarifying remarks, Applicant respectfully submits that specification and claims as filed in this application are in full compliance with the requirements of 35 USC 101 and 35 USC 112(1). Accordingly, Applicant respectfully requests that the rejections under 35 USC 101 and 35 USC 112(1) be withdrawn, and that Examiner proceed with further substantive examination of the pending claims.

Examiner is welcome to contact Applicant's agent by telephone if such communication may be helpful in the further examination of this case.

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